(12) PATENT APPLICATION
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 199516163 A1**

(54) Title
Insect proofing method and apparatus

(51) International Patent Classification(s)
E04B 001/72 **E04H 009/16**

(21) Application No: **199516163** (22) Date of Filing: **1995.03.29**

(30) Priority Data

(31) Number	(32) Date	(33) Country
PM4794	**1994.03.29**	**AU**

(43) Publication Journal Date: **1995.10.05**

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(D1)

X = cl. 1 - 6, 12
Y = cl. 8

16163/95

AUSTRALIA
Patents Act 1990

Section 29

PATENT REQUEST:- STANDARD PATENT

We being the persons identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.

Full application details follow.

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Invention Title:- "INSECT PROOFING METHOD AND APPARATUS"

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B022341 29/03/95

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ASSOCIATED PROVISIONAL APPLICATION DETAILS

Application Number:- PM 4794
Date filed:- 29 March, 1994

DATED THIS Twenty-ninth DAY OF March, 1995.

PIZZEY & COMPANY

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FEE:- A$280.00

AU9516163

(12) PATENT ABSTRACT (11) Document No. AU-A-16163/95
(19) AUSTRALIAN PATENT OFFICE

(54) Title
INSECT PROOFING METHOD AND APPARATUS

(51)[6] International Patent Classification(s)
E04B 001/72 E04H 009/16

(21) Application No. : 16163/95

(22) Application Date : 29.03.95

(30) Priority Data

(31) Number	(32) Date	(33) Country
PM4794	29.03.94	AU AUSTRALIA

(43) Publication Date : 05.10.95

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There is provided a method and apparatus for termite protection of a building. A footing (10) and foundation (11) are profiled in a conventional manner to support a slab (12) poured thereover. Prior to pouring the slab (12), a termite barrier (13) comprising a laminate of polyamide film and a polyethylene film bonded with a hot melt interlayer is laid over the foundation (11) and extending to overlap the edge portion (14) of the footing (10) by means of an overlapping portion (15). Also located in overlapping relation with the portion (15) of the termite barrier (13) is an external barrier portion (16) extending through to the dampcourse (22) of the wall. A separate damp flashing (20) is provided and is retained beneath the damp course (22) with the external barrier portion (16).

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CLAIM

1. A method of termite control for buildings including identifying a potential termite path in the construction of said building and installing across said path a termite barrier comprising a composite of a termite resistant material and a support material therefor.

"INSECT PROOFING METHOD AND APPARATUS"

This invention relates to insect proofing method and apparatus.

This invention has particular but not exclusive application to termite proofing buildings or the like, and for illustrative purposes reference will be made to such application. However, it is to be understood that this invention could be used in other applications, such as providing generalized barriers to boring insects.

Building standards prescribe chemical and physical methods of preventing termites from entering buildings and controlling them after they have entered a building. These standards are currently being reviewed in the light of community concern in relation to use of persistent insecticides in such treatments.

The present Australian standard describes a two part chemical barrier for use in controlling termites under slab floor constructions. Part A of the process consists of creating a chemical barrier under the concrete slab before it is poured. Part B consists of creating a chemical barrier to prevent termites from entering the building from outside.

It is the Part B process which creates the most concern due to the fact that it involves applying highly concentrated persistent insecticidal chemicals around the outside of the building where third parties may come into contact with it. Chemicals placed outside the building are also subject to degradation at a rate faster than their nominal rate due to

the action of the environment such as leaching and oxidation. The barrier may also be broken by any digging in the soil or circumvented by the placement of gardens or the like.

It has been proposed to utilize stainless steel mesh as a sub-slab barrier thereby replacing the Part A process and potentially replacing the Part B process. However, stainless steel mesh of the type required, that is, the type having apertures smaller than the head of a termite, is expensive. Installation under construction site conditions often results in point deformations opening the mesh. Additionally, the installation of an effective barrier is compromised by the usual timing of building phases particularly in the case of slab and frame construction where an outer brick veneer skin is used, resulting in discontinuity of protection or the requirement to use the undesirable part B treatment in addition to the mesh. The mesh takes up to 2 days to install.

The stainless steel used for the mesh or any metal noble enough to be durable in use is also cathodic to many common building materials such as aluminum or steel. These components accordingly would tend to corrode preferentially in the presence of the mesh. Additionally, the large area of the generally stainless steel mesh results in different portions of the mesh being at different electrochemical potentials, which may result in corrosion failure of a portion of the mesh.

The mesh is generally laid from the damp course at the

outer skin of the building, dips down into the wall cavity and is trapped under the sole plate of the inner wall. Termites can wedge themselves under the wall plate especially about securing bolts or the like. Alternatively, for wooden walled structures the mesh is laid extending up the outside of the footing to the exterior of the wall, which arrangement requires additional chemical treatment.

The mesh can only be provided in amounts capable of being manufactured, transported and handled by the tradesmen installers. Thus the mesh requires may joins which are usually made by gluing. Since the metal mesh has very little give or stretch, the normal forces on the mesh imposed by the processes of construction translate stresses to the glued joins, which may result in failure at the joins. Further, the mesh, being open, requires the use of a conventional moisture barrier to protect the slab and footings from transmitting rising damp to the structure. Moisture barriers are generally of polyethylene or other plastic sheet which is relatively soft. The stainless steel mesh tends to cause damage to the moisture barrier when the weight of poured concreted and other building materials presses the mesh against the moisture barrier.

The present invention aims to substantially alleviate at least one of the above disadvantages and to provide insect barrier methods and apparatus which will be reliable and efficient in use. Other objects and advantages of this invention will hereinafter become apparent.

With the foregoing and other objects in view, this invention in one aspect resides broadly in a method of termite control for buildings including identifying a potential termite path in the construction of said building and installing across said path a termite barrier comprising a composite of a termite resistant material and a support material therefor.

The potential termite path may include through the slab of slab-on-ground construction, through the footings of a structure, through the wall cavity of the structure, up and over supporting piers or the like. For example, the termite barrier may comprise a sheet material disposed between the damp course of the structure over the footings and extending to the sole plate of timber or metal framed constructions, or to the juncture of the footing with the slab in slab-on-ground construction.

In a further aspect this invention resides broadly in a termite barrier comprising a composite of a termite resistant material and a support material therefor.

The termite barrier may comprise a laminate or impregnate of the termite resistant material in a matrix. For example, the termite resistant material may comprise metal filament material, preferably disposed in an expandible assembly such that it may stretch with its matrix, polymeric film, particulate termite resistant materials in a flexible matrix, or glass fibre carbon fibre or polyaramid fabric material or materials of other inorganic or organic fibres,

or other termite resistant material. Preferably, the termite resistant material comprises a substantially continuous polyamide, polyimide or polytetrafluoroethylene film or coating applied to the support.

The support material may comprise any suitable material selected for compatibility with the termite resistant material. The support material may provide moisture barrier properties to the composite. The support material may also provide one or more of physical, chemical or environmental protection for the termite resistant material. For example, the support material may comprise a polymeric material such as polyethylene, metal foils, woven materials such as woven polypropylene or the like.

Preferably, the termite barrier comprises a laminate of one or more termite resistant materials with one or more support materials. For example, the termite barrier may comprise a laminate or termite resistant metal or plastic films or foils, either thermally or adhesively laminated to a support structure. Preferably, the termite resistant layer of the laminate is provided of a polymeric material having a toughness or surface properties adapted to physically defeat attack by termites by toughness or low friction respectively. Termite saliva is an aggressive material and accordingly it is preferred that termite resistant layer of the laminate is resistant to chemical attack by termite saliva. Polyamide or polyimide materials are preferred for possession of a relatively low friction surface which is both resistant to

the action of termite mandibles and not appreciably attacked by termite secretions. For example, the nylon-class sheeting materials known as Polymide 11 and 12 manufactured by Elf Atochem and sold under the trade mark RILSAN may advantageously be used.

The support layer of the laminate is preferably capable, either alone or in lamination with the termite resistant layer, of providing moisture barrier properties to the laminate in order to reduce the overall installation time and cost in the construction. The support layer is also preferably of a relatively plastic material such that the installation over penetrations such as reinforcing bars may be made by means of an undersize hole in the laminate being forcable over the bars or the like such that the edges of the holes conform closely thereto. The laminate may be formed by any suitable means generally determined by the selection of the components of the laminate, such as by thermal bonding or by means of an adhesive interlayer.

The termite barrier may be installed either prior to the pouring of the footing for the building, in which case the termite barrier preferably extends about the excavation for the footing, or alternatively may be installed after pouring of the footing, whereupon it is preferred that the edges of the termite barrier be entrapped in and extend beyond the pour of the floor over the footing.

The free edge of the termite barrier may be secured to an exterior wall of the building above ground level.

Preferably, the termite barrier is allowed to extend continuously to and through the damp course of the outer wall whereupon the termite barrier forms at least part of the dampproofing of the dampcourse.

The termite barrier may be utilized in any suitable thickness determined by the properties of the materials selected and for example may be utilized in thicknesses ranging from 0.04 mm to 1.0 mm, and in the case of the preferred polymer laminates, may be in the region of from 0.1 to 0.3 mm. A typical construct may comprise outer layers of a polymer such as low density polyethylene (LDPE) of at least 25 micron thickness to provide environmental protection to an inner barrier layer of for example NYLON 11 of greater than 40 micron thickness. Where required for interpolymer compatibility, the layers may be bound together by a thin tie layer, such as a compatible adhesive hot melt interlayer such as 5 microns of maleic anhydride monomer modified linear low density polyethylene (LLDPE).

Preferably, the material is selected to have a low moisture transfer rate therethrough such that the barrier forms an effective underfloor membrane moisture barrier as well as preventing termite entry. However, it is also envisaged that the method of the present invention may be instituted about the periphery of the building only or may utilize the preferred joining methods to attach to a conventional underfloor membrane.

Where the barrier material must be joined this may be by

means of adhesive taping, folding, welding or any other selected means whereby an effectively termite proof and preferably moisture proof join is formed. Preferably, the joins are made by means of elongate retaining apparatus which may comprise an elongated body member of plastics or like extruded construction and including a channel portion adapted to receive the edges of material to be joined and a retaining member adapted to snap into the channel thereby entrapping the material edge.

The elongate body member may consist essentially of the aforesaid channel portion or may include for example a flange or the like adapted to be embedded in concrete, fixed to an external wall or the like. The elongate retaining apparatus may be adapted to retain two or more sheet edges. For example, in the region of the outer wall of the building to be treated, the retaining apparatus may retain the termite proof sheet, a dampcourse portion (whether substituting for or in addition to damp coursing material) extending from the outer brick veneer up into the cavity within the brick veneer. This construction may be provided from two or three sheet portions, depending upon the materials chosen and their relative suitability for the respective barrier portions.

In order to allow for rational construction in accordance with present practice without compromising the integrity of the barrier in the critical region of the edges of the structure, the barrier may be provided having a first barrier portion of one thickness to provide an adequate

underfloor barrier and a thicker, more durable barrier portion for providing the aboveground to underfloor protection. The respective portions may be joined as hereinbefore described or, and in the case of slab construction, the barrier portions may be overlapped in the region of support of the slab on the footing. The overlapping portions of each portion may be perforated in order to provide an adhesive key between the slab, footing and portions, as may be any edge region of material extending beyond the aforementioned elongate joining means.

Where the floor is penetrated to provide entry for pipes or other conduit, the underfloor portion of the barrier may be provided with additional sleeve means suitably secured thereto and conforming sufficiently closely about the pipe or conduit to maintain the termite proof integrity of the barrier. Preferably, the sleeve also provides an effective moisture barrier at the pipe or conduit. For example, the sleeve may comprise moulded piece of the membrane material adapted to conform about the stand pipe or the like and having a flange portion adapted to be integrated in the subfloor barrier material by gluing or locking with the aforementioned securing means. To this end the flange portion may have a substantially straight edged periphery adapted to be clipped by pieces of the securing means or may be circular or other shape permitting the flange to be clipped by use of a single piece of the securing means, to a corresponding portion of the barrier material. The portion

of the sleeve about the stand pipe or the like may extend up into the slab space or above the slab space and may be secured to the stand pipe or the like by means of adhesive, cable clamp, hose clamp or the like, or combinations thereof.

In order that this invention may be more readily understood and put into practical effect, reference will now be had to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein:-

FIG. 1 illustrates a section through a building construction utilising insect proofing in accordance with the present invention;

FIG. 2 illustrates use of the present invention about a penetration through a slab in building construction;

FIG. 3 illustrates a joining method for use in conjunction with insect proofing methods of the present invention;

FIG. 4 illustrates an alternative joining method to that illustrated in FIG. 3; and

FIG. 5 illustrates an alternative arrangement to that illustrated in FIG. 1.

In the figures there is provided a building construction including a footing 10 in a foundation 11. The foundation 11 is profiled in a conventional manner to support a slab 12 poured thereover. Prior to pouring the slab 12, a termite barrier 13 comprising a nylon-11/maleic anhydride modified LLDPE/LDPE laminate is laid over the foundation 11 with the LDPE layer lowermost, and extending to overlap the edge

portion 14 of the footing 10 by means of a perforate overlapping portion 15. The overlapping portion 15 is perforated to provide adhesion between the footing 10 and the slab 12.

Also located in overlapping relation with the portion 15 of the termite barrier 13 is an external barrier portion 16 of the laminate material extending through to the dampcourse 22 of the wall. A separate damp flashing 20 is provided and is retained beneath the damp course 22 with the external barrier portion 16. The lower portion 17 of the external barrier portion 16 is perforated in the region of the slab, to provide an adhesive key, with care taken to prevent exposure of the penetrations. The damp flashing is adapted to be bonded by mortar beneath the damp course 22 in the manner of a conventional damp flashing.

The outer vertical edge 23 of the slab 12 supports the floor plate 24 of an interior load bearing stud wall 25 in a conventional manner.

Where a penetration need be made through the slab 12, this represents a potential point of entry of termites. Where such penetrations are made, as illustrated in Figure 2, the termite barrier 13 is preferably turned through the opening 26 and is sleeved by a laminate sleeve 27 which is glued or welded at 30 to the barrier 13 and is clamped at 31 to the pipe or protrusion 32 through the opening 26.

Where the barrier 13 is to be joined, such as will be required for large expanses of slab, the adjacent barrier

portions 13 are preferably triple folded as at 33 in Figure 3 and retained by a spring type clamp 34 or the hereindescribed elongate clamping apparatus.

In the joining method and apparatus illustrated in FIG. 4, there is provided an elongate plastic body member 40 having a mounting flange 41 which may be optionally affixed to a substrate if desired and an elongate channel portion 42. The elongate channel portion 42 is of substantially part circular cross section and has an elongate opening 43 of a width less than the diameter of the cross section by at least four thicknesses of the material to be joined. The material of the elongate plastic body member 40 is selected such that the opposed lips of the channel portion 42 may be elastically deformed by the insertion of an elongate cylindrical locking member 44 and edge portions 45 of at least two of the subfloor membrane and/or barrier materials. The dimensions of the respective channel portion 42 and locking member 44 are such that the lips may retain the edge portions 45 and locking member 44 in the channel portion upon elastic recovery of the lips.

In the alternative embodiment illustrated in FIG. 5, the foundation 11 is excavated for the footing 10 and slab 12 and the excavation lined with the laminate barrier 13, which extends to the top of the outer side of the footing 10. The external barrier portion 16 in this embodiment is entrapped between the slab 12 and the floor plate 24 at its inner edge and is retained beneath the damp course 22 as before at its

outer edge, and forms a moisture trap by virtue of its being of dimension to form a gutter like profile at 28. Again, a separate damp flashing 20 is coentrapped beneath the damp course 22.

It will of course be realised that while the above has been given by way of illustrative example of this invention, all such and other modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as defined in the claims appended hereto.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of termite control for buildings including identifying a potential termite path in the construction of said building and installing across said path a termite barrier comprising a composite of a termite resistant material and a support material therefor.

2. A method of termite control according to Claim 1, wherein said potential termite path is selected from the paths through the slab of slab-on-ground construction, through the footings of a structure, through the wall cavity of the structure, up and over supporting piers or the like.

3. A method of termite control according to Claim 2, wherein said termite barrier is installed prior to the pouring of said footings for the building, said termite barrier preferably extending about the excavation for the footings.

4. A method of termite control according to Claim 2, wherein said termite barrier is installed after pouring of said footings, and wherein the edges of the termite barrier are entrapped by and extend beyond the pour of a slab over the footing.

5. A method of termite control according to Claim 4, wherein the free edge of the termite barrier extending beyond said slab are secured to an exterior wall of the building above ground level.

6. A termite barrier comprising a composite of a termite resistant material and a support material therefor.

7. A termite barrier according to Claim 6, wherein one or more of said termite resistant material and said support material comprise layers of a laminate.

8. A termite barrier according to Claim 7, wherein said termite resistant material comprises one or more layers of a material selected from substantially continuous polyamide, polyimide or polytetrafluoroethylene film or coating applied to the support.

9. A termite barrier according to any one of Claims 7 and 8, wherein said support material is selected to provide one or more of moisture barrier properties to the composite, or physical, chemical or environmental protection for the termite resistant material.

10. A termite barrier according to Claim 9, wherein said support material comprises one or more layers of a polymeric material.

11. A termite barrier according to any one of Claims 6 to 10, and comprising a laminate of one or more termite resistant layers provided of a polymeric material having a toughness or surface properties adapted to physically defeat attack by termites by toughness or low friction respectively, and resistant to chemical attack by termite saliva.

12. A termite barrier according to Claim 11, wherein said termite resistant layer or layers are supported on one or more support layers of said support material capable, either alone or in lamination with the termite resistant layer, of providing moisture barrier properties to the laminate.

13. A termite barrier according to Claim 11, wherein said support layer or layers are plastic such that the installation over penetrations such as reinforcing bars may be made by means of an undersize hole in the laminate being forcable over the bars or the like such that the edges of the holes conform closely thereto.

14. A termite barrier according to any one of Claims 7 to 13, wherein the layers of said laminate are bonded by means of an adhesive interlayer.

15. A termite barrier according to any one of Claims 6 to 14 and comprising a sleeve portion adapted to be secured to a pipe or other conduit, and a flange portion adapted to be secured to an underfloor portion of the termite barrier.

16. A termite barrier according to Claim 15, wherein said sleeve portion extends above the slab space and is secured to the pipe or other conduit by means selected from adhesive, cable clamp, hose clamp or the like, or combinations thereof.

17. Retaining apparatus adapted for use in joining portions of the termite barrier of Claims 6 to 16 and comprising an elongated body member including a channel portion adapted to receive overlapping edges of termite barrier portions to be joined, and a retaining member adapted to snap into the channel thereby entrapping the termite barrier portions.

18. Retaining apparatus according to Claim 17, wherein said elongate body member includes a flange or the like adapted to be embedded in concrete, fixed to an external wall or the like.

19. A method of termite control for buildings substantially as hereinbefore described with reference to the accompanying drawings.

20. A termite barrier substantially as hereinbefore described with reference to the accompanying drawings.

21. Retaining apparatus substantially as hereinbefore described with reference to the accompanying drawings.

DATED THIS Twenty-ninth DAY OF March, 1995.

GUARDIAN PEST AND WEED CONTROL SERVICES PTY. LTD.
by
PIZZEY AND COMPANY PATENT ATTORNEYS

ABSTRACT

There is provided a method and apparatus for termite protection of a building. A footing (10) and foundation (11) are profiled in a conventional manner to support a slab (12) poured thereover. Prior to pouring the slab (12), a termite barrier (13) comprising a laminate of polyamide film and a polyethylene film bonded with a hot melt interlayer is laid over the foundation (11) and extending to overlap the edge portion (14) of the footing (10) by means of an overlapping portion (15). Also located in overlapping relation with the portion (15) of the termite barrier (13) is an external barrier portion (16) extending through to the dampcourse (22) of the wall. A separate damp flashing (20) is provided and is retained beneath the damp course (22) with the external barrier portion (16).

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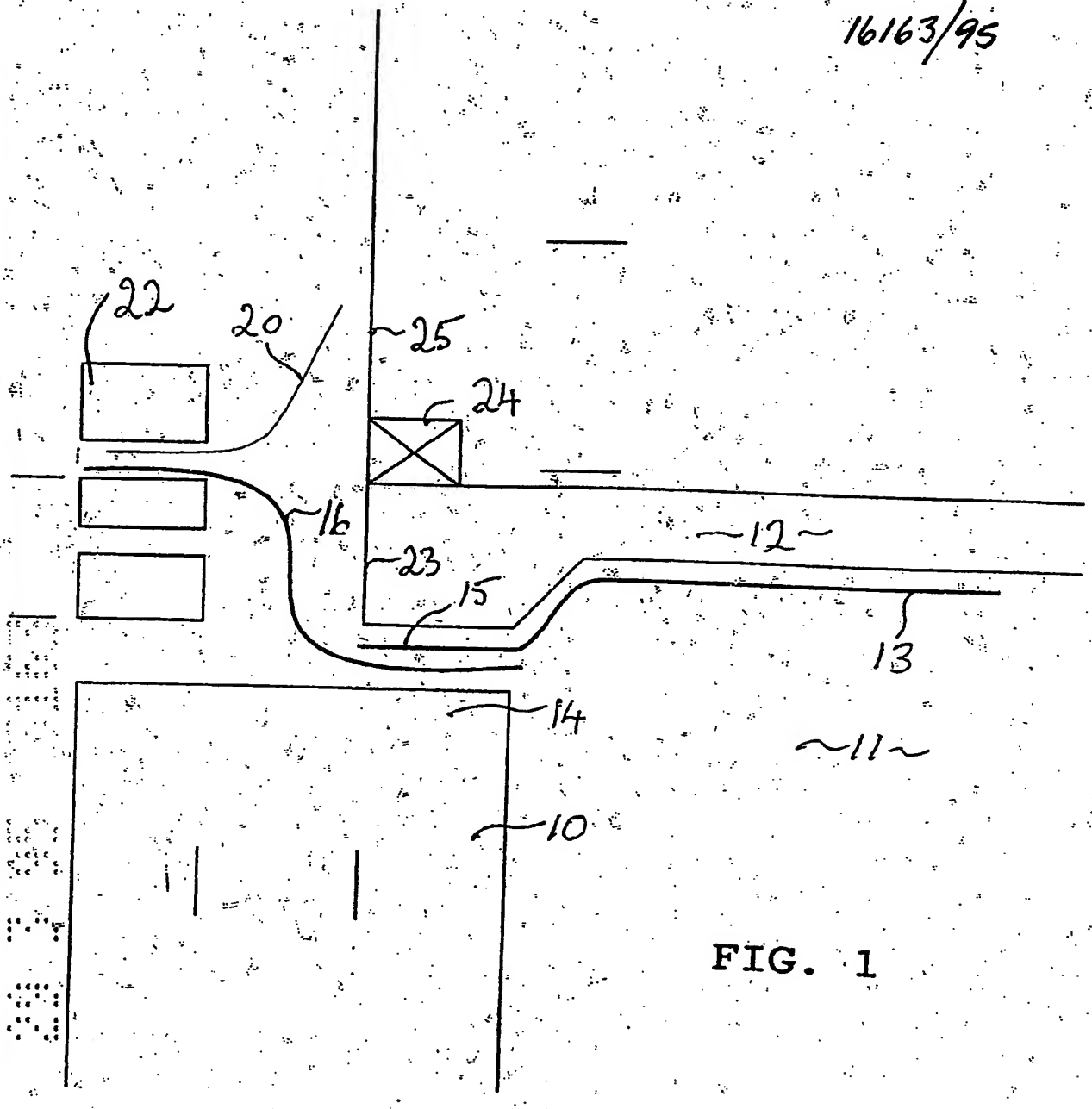

FIG. 1

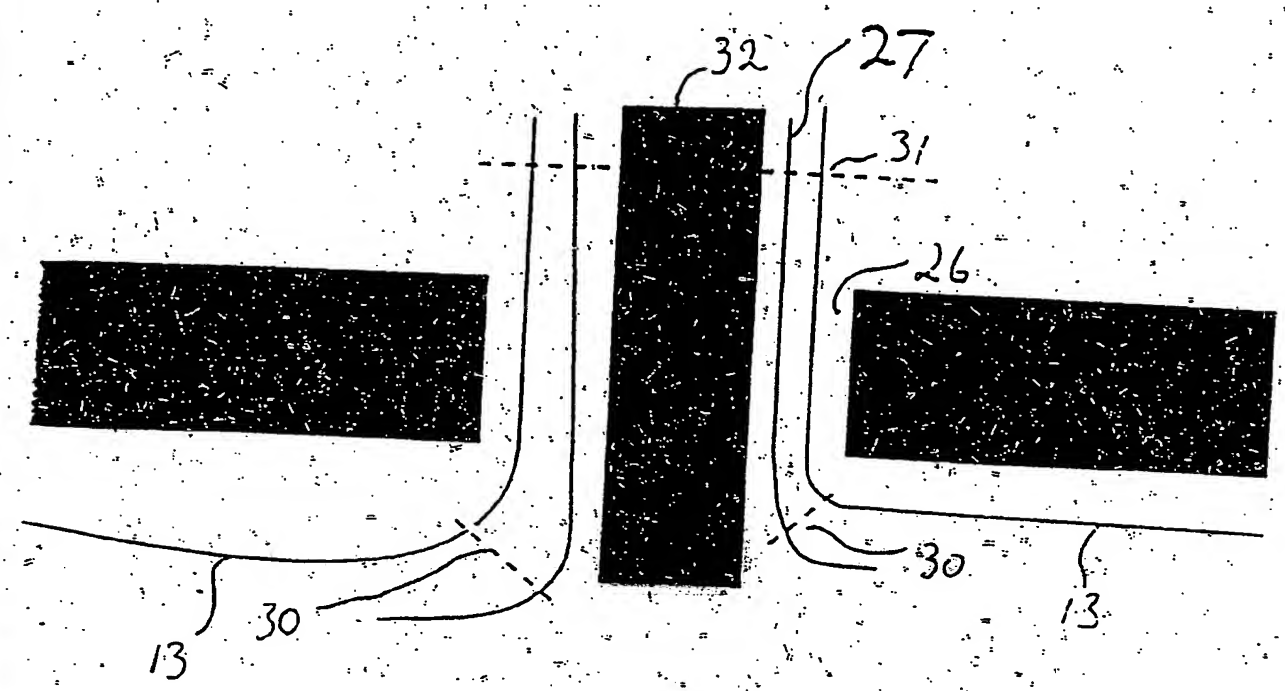

FIG. 2

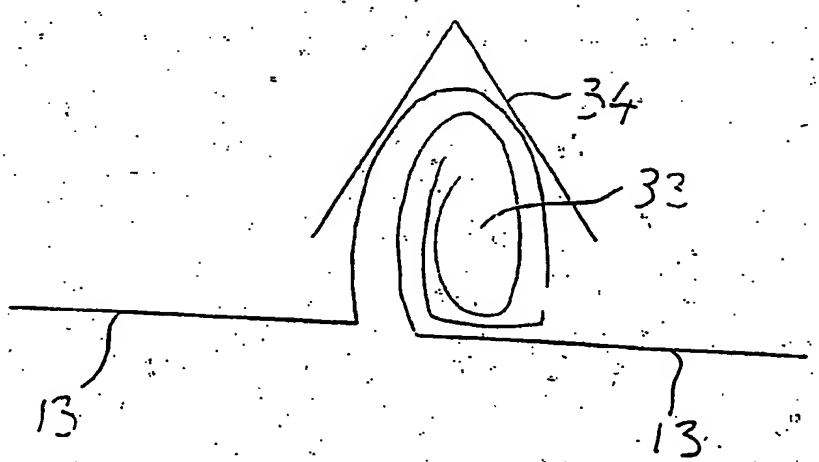

FIG. 3

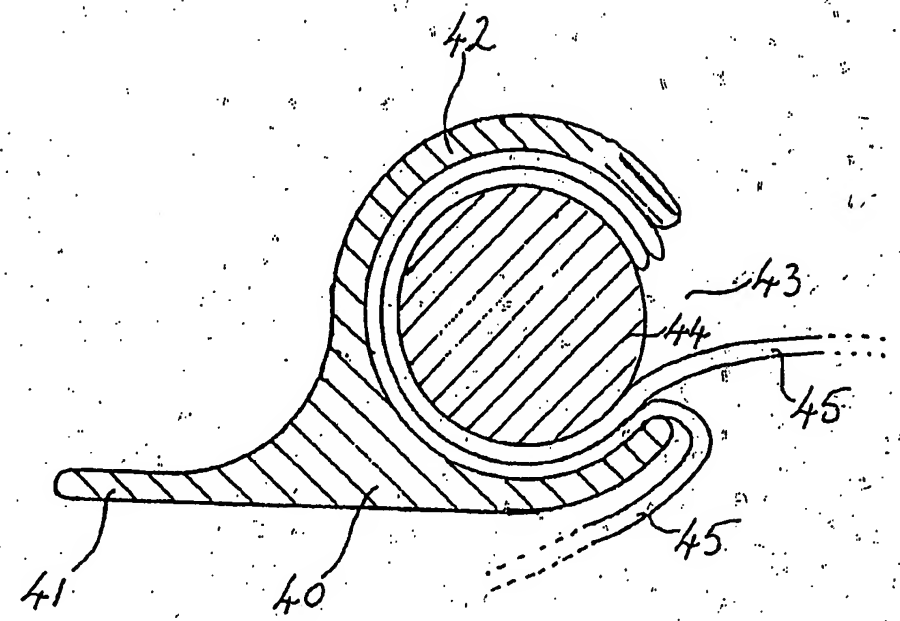

FIG. 4

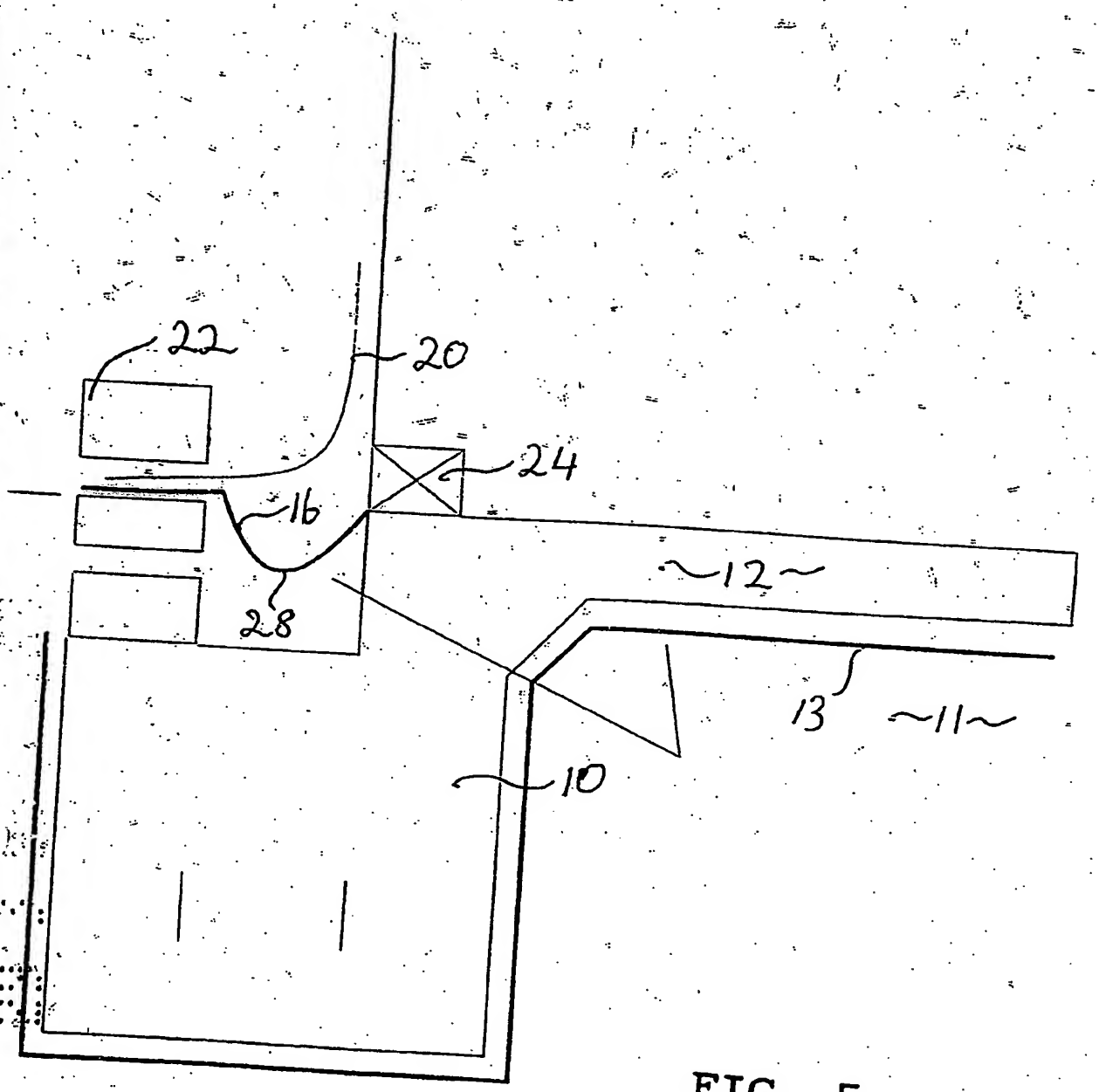

FIG. 5

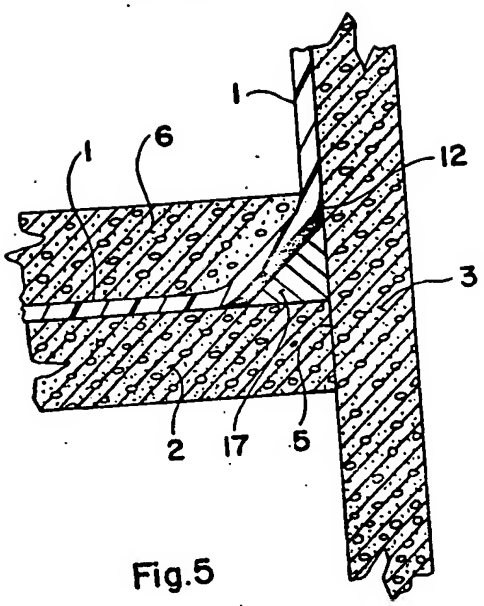

Fig.5

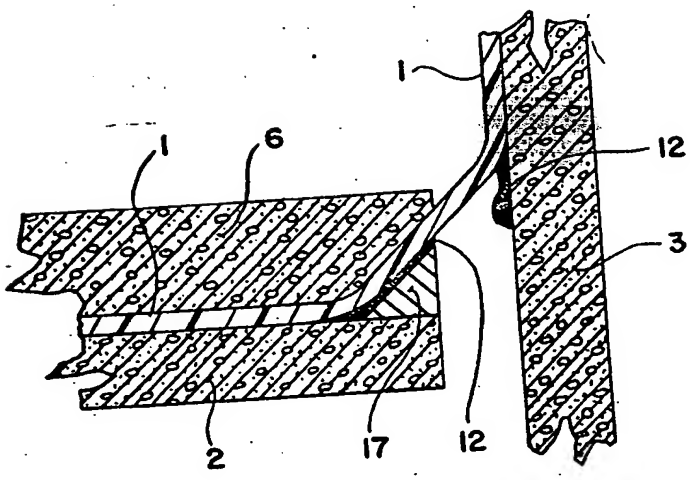

Fig.6